CLAIMS

WHAT IS CLAIMED:

1. A method, comprising:

forming a process layer;

forming an ARC layer above said process layer;

determining at least one optical characteristic of said ARC layer;

determining, based upon said determined at least one optical characteristic of said ARC layer, at least one parameter of a stepper exposure process; and

performing said stepper exposure process on at least one wafer.

2. The method of claim 1, wherein forming a process layer comprises depositing a process layer.

3. The method of claim 1, wherein forming a process layer comprises forming a process layer comprised of at least one of polysilicon, a metal and silicon dioxide.

4. The method of claim 1, wherein forming an ARC layer above said process layer comprises depositing an ARC layer above said process layer.

5. The method of claim 1, wherein forming an ARC layer above said process layer comprises forming an ARC layer comprised of at least one of silicon nitride, silicon oxynitride, silicon dioxide and titanium nitride above said process layer.

6. The method of claim 1, wherein determining at least one optical characteristic of said ARC layer comprises measuring at least one optical characteristic of said ARC layer.

7. The method of claim 1, wherein determining at least one optical characteristic of said ARC layer comprises determining at least one optical characteristic of said ARC layer by using at least one of a scatterometer, a reflectometer and a spectroscopic ellipsometer.

8. The method of claim 1, wherein determining, based upon said determined optical characteristic of said ARC layer, at least one parameter of a stepper exposure process comprises determining, based upon said determined optical characteristic of said ARC layer, at least one of an exposure dose and a focus of a stepper exposure process.

9. The method of claim 1, wherein determining at least one optical characteristic of said ARC layer comprises determining at least one of a reflectivity, an index of refraction, and an extinction coefficient of said ARC layer.

10. A method, comprising:

depositing a process layer;

depositing an ARC layer above said process layer;

measuring at least one optical characteristic of said ARC layer;

determining, based upon said measured at least one optical characteristic of said ARC layer, at least one parameter of a stepper exposure process; and

performing said stepper exposure process on at least one wafer.

11. The method of claim 10, wherein depositing a process layer comprises depositing a process layer comprised of at least one of polysilicon, a metal and silicon dioxide.

12. The method of claim 10, wherein depositing an ARC layer above said process layer comprises depositing an ARC layer comprised of at least one of silicon nitride, silicon oxynitride, silicon dioxide and titanium nitride above said process layer.

13. The method of claim 10, wherein measuring at least one optical characteristic of said ARC layer comprises determining at least one optical characteristic of said ARC layer by using at least one of a scatterometer, a reflectometer and a spectroscopic ellipsometer.

14. The method of claim 10, wherein determining, based upon said measured at least one optical characteristic of said ARC layer, at least one parameter of a stepper exposure process comprises determining, based upon said measured at least one optical characteristic of said ARC layer, at least one of an exposure dose and a focus of a stepper exposure process.

15. The method of claim 10, wherein measuring at least one optical characteristic of said ARC layer comprises measuring at least one of a reflectivity, an index of refraction, and an extinction coefficient of said ARC layer.

16. A method, comprising:

depositing a process layer;

depositing an ARC layer comprised of at least one of silicon nitride, silicon oxynitride, silicon dioxide and titanium nitride above said process layer;

measuring at least one optical characteristic of said ARC layer;

determining, based upon said measured at least one optical characteristic of said ARC layer, at least one parameter comprised of at least one of an exposure dose and a focus of a stepper exposure process; and

performing said stepper exposure process on at least one wafer.

17. The method of claim 16, wherein depositing a process layer comprises depositing a process layer comprised of at least one of polysilicon, a metal and silicon dioxide.

18. The method of claim 16, wherein measuring at least one optical characteristic of said ARC layer comprises determining at least one optical characteristic of said ARC layer by using at least one of a scatterometer, a reflectometer and a spectroscopic ellipsometer.

19. The method of claim 16, wherein measuring at least one optical characteristic of said ARC layer comprises measuring at least one of a reflectivity, an index of refraction, and an extinction coefficient of said ARC layer.

20. A method, comprising:

forming a process layer above each of a plurality of wafers;

forming an ARC layer above each of said process layers;

determining at least one optical characteristic of each of said ARC layers;

determining, based upon said determined at least one optical characteristic of said ARC layers, at least one parameter of a stepper exposure process; and

performing said stepper exposure process on at least one wafer.

21. The method of claim 20, wherein forming a process layer comprises depositing a process layer.

22. The method of claim 20, wherein forming a process layer comprises forming a process layer comprised of at least one of polysilicon, a metal and silicon dioxide.

23. The method of claim 20, wherein forming an ARC layer above each of said process layers comprises depositing an ARC layer above each of said process layers.

24. The method of claim 20, wherein forming an ARC layer above each of said process layers comprises forming an ARC layer comprised of at least one of silicon nitride, silicon oxynitride, silicon dioxide and titanium nitride above each of said process layers.

25. The method of claim 20, wherein determining at least one optical characteristic of each of said ARC layers comprises measuring at least one optical characteristic of each of said ARC layers.

26. The method of claim 20, wherein determining at least one optical characteristic of each of said ARC layers comprises determining at least one optical characteristic of each of said ARC layers by using at least one of a scatterometer, a reflectometer and a spectroscopic ellipsometer.

27. The method of claim 20, wherein determining, based upon said determined optical characteristic of said ARC layers, at least one parameter of a stepper exposure process

comprises determining, based upon said determined optical characteristic of said ARC layers, at least one of an exposure dose and a focus of a stepper exposure process.

28. The method of claim 20, wherein determining at least one optical characteristic of each of said ARC layers comprises determining at least one of a reflectivity, an index of refraction, and an extinction coefficient of each of said ARC layers.

29. The method of claim 20, wherein determining at least one optical characteristic of said ARC layers comprises averaging a plurality of optical measurements of said ARC layers.

30. A system, comprising:

an optical metrology tool for measuring at least one optical characteristic of at least one ARC layer formed above at least one process layer;

a controller for determining, based upon data obtained from said optical metrology tool, at least one parameter of a stepper exposure process; and

a stepper tool for performing said exposure process comprised of said determined at least one parameter.

31. The system of claim 30, wherein said optical metrology tool is comprised of at least one of a scatterometer, a reflectometer and a spectroscopic ellipsometer.

32. The system of claim 30, wherein said controller is a stand-alone device.

33. The system of claim 30, wherein said controller is resident on at least one of said optical metrology tool and said stepper tool.

34. The system of claim 30, wherein said controller is adapted to determine at least one of an exposure dose and a focus of said stepper exposure process.

35. The system of claim 30, wherein said stepper tool is adapted to perform said stepper exposure process comprised of said determined at least one parameter on at least one wafer.

36. A system, comprising:

metrology means for measuring at least one optical characteristic of at least one ARC layer formed above at least one process layer;

a controller means for determining, based upon data obtained from said metrology means, at least one parameter of a stepper exposure process; and

means for performing said exposure process comprised of said determined at least one parameter.

37. The system of claim 36, wherein said metrology means is comprised of at least one of a scatterometer, a reflectometer and a spectroscopic ellipsometer.

38. The system of claim 36, wherein said controller means is a stand-alone device.

39. The system of claim 36, wherein said controller means is resident on at least one of said metrology means and said means for performing an exposure process.

40. The system of claim 36, wherein said controller means is adapted to determine at least one of an exposure dose and a focus of said exposure process.

41. The system of claim 36, wherein said means for performing an exposure process is adapted to perform an exposure process comprised of said determined at least one parameter on at least one wafer.